



## Letter to the Editor

# Anthropometric accuracy and reproducibility in forensic anthropology case work and research

Dear Sir,

Estimation of sex along with other parameters of biological profile such as stature, age and ancestry provides vital clue in the identification of the deceased. Estimation of sex thus, is an important exercise in establishing the biological profile of unknown human remains in medico-legal investigations. Sex can be estimated with high levels of accuracy from pelvis, skull, femur and other long bones. Besides, studies have been conducted on sex estimation from other bones of the human body such as clavicle, sternum, patella and hand and foot bones which may help in determination of sex in the absence of other more sexually dimorphic bones of the human skeleton.

A recently published research by Akhlaghi et al.<sup>1</sup> is a useful addition to the present literature. The authors have attempted to create the standards for determination of sex by using two anthropometric measurements of clavicle in an Iranian population. We wish to congratulate the authors for making a useful contribution to the forensic anthropological knowledge. Author's attempt is praiseworthy and the results open a wider scope for further research into this anthropological topic.

In this regard, we wish to emphasize on the importance of anthropometric accuracy and reproducibility in forensic anthropology case work and research. The findings of study conducted without calculating the technical error is subject to major error.<sup>2</sup> This is of utmost importance in forensic studies based on anthropometric measurements as it gives an idea about the accuracy and reproducibility of the measurement.<sup>3,4</sup> The issue becomes more imperative in the measurements which are used for sex determination where erroneous results can be obtained in distinguishing between males and females. Similarly, the very pertinent issue of the observer bias in taking the anthropometric measurements also needs to be addressed. Well defined landmarks are the most important prerequisite for taking accurate anthropometric measurements. This is of particular significance with regard to measurements such as mid-shaft circumference of the clavicle where the landmarks for measurements are not well defined.

The present correspondence is intended to emphasize on the essential issues regarding the accuracy and reliability of measurements in forensic studies. These suggestions would enhance the practical utility of the future studies following anthropometric measurements in forensic case work.

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## Conflicts of interest

The authors declare no conflict of interest regarding this correspondence.

## References

1. Akhlaghi M, Moradi B, Hajibeygi M. Sex determination using anthropometric dimensions of the clavicle in Iranian population. *J Forensic Leg Med* 2012;**19**: 381–5.
2. Krishan K, Kumar R. Determination of stature from cephalo-facial dimensions in a North Indian population. *Leg Med* 2007;**9**:128–33.
3. Kanchan T, Krishan K. Anthropometry of hand in sex determination of dismembered remains – a review of literature. *J Forensic Leg Med* 2011;**18**:14–7.
4. Ulijaszek SJ, Kerr DA. Anthropometric measurement error and the assessment of nutritional status. *Br J Nutr* 1999;**82**(3):165–77.

Kewal Krishan, MSc, PhD, Sr. Assistant Professor\*  
Department of Anthropology, Panjab University, Sector-14,  
Chandigarh 160 014, India

Tanuj Kanchan, MD, Associate Professor  
Department of Forensic Medicine, Kasturba Medical College,  
Manipal University, Mangalore, Karnataka, India

\* Corresponding author. Tel.: +91 172 2534230 (office),  
+91 9876048205 (mobile).  
E-mail address: [gargkk@yahoo.com](mailto:gargkk@yahoo.com) (K. Krishan)

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